

Claims

- 5 1. Optoelectronic component with a light emitting or light receiving element (1) and a system carrier (9) supporting the element (1) for the support or assembly of said component, an auxiliary carrier (2) which is transparent to light at least in some areas or is at least translucent and is made of heat conducting material being provided, said auxiliary carrier (2) being connected to the system carrier (9) and thermally coupled to the element
- 10 (1) and a recess (2a) through which the light passes being provided in said auxiliary carrier (2),
characterised in that
the recess (2a) is covered with a thin covering layer formed from said auxiliary carrier (2), through which covering layer the light passes.
- 15 2. Optoelectronic component according to claim 1,
characterised in that
the auxiliary carrier (2) has an electrical bonding whereby said auxiliary carrier (2) is electrically connected to the element (1).
- 20 3. Optoelectronic component according to claim 1 or 2,
characterised in that
the auxiliary carrier (2) is arranged between the system carrier (9) and the element (1) and the auxiliary carrier (2) and the element (1) are
- 25 mechanically connected in a substantially planar fashion.
- 30 4. Optoelectronic component according to one of the claims 1 to 3,
characterised in that
the auxiliary carrier (2) has a light-sensitive sensor (3) formed in or on the same substrate.

5. Optoelectronic component according to one of the claims 1 to 3,
characterised in that
a light-sensitive sensor which is formed on or in the element (1) is
provided.
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6. Optoelectronic component according to one of the claims 1 to 5,
characterised in that
the system carrier (9) consisting of non-transparent material is provided
with an opening (9a) through which light passes.
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7. Optoelectronic component according to one of the claims 1 to 6,
characterised in that
the recess (2a) in the auxiliary carrier (2) and/or the opening (9a) of the
system carrier (9) has the configuration of a truncated cone or truncated
pyramid or of a cylinder, the walls of said recess (2a) and/or opening (9a)
having smooth lateral faces (2c).
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8. Optoelectronic component according to one of the claims 1 to 7,
characterised in that
an optical arrangement (11 or 21) which focuses and/or changes the
beam path of the light is provided in the optical axis (OA) of the
component.
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9. Optoelectronic component according to claim 8,
characterised in that
the optical arrangement (11 or 21) is fitted inside the opening (9a) of the
system carrier (9) and/or the recess (2a) of the auxiliary carrier (2).
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10. Optoelectronic component according to claim 8 or 9;
characterised in that
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the optical arrangement is formed as a lens (11) or a transparent platelet (21), the platelet (21) being arranged at a defined angle (22) between its surface normal (FN) and the optical axis (OA) of the component.

5 11. Optoelectronic component according to claim 10,
characterised in that
the angle (22) of the platelet arrangement is so selected that a smallest
possible proportion of light is reflected by the surface (23) of the platelet
10 (21), and/or in that a predetermined proportion (14) thereof is reflected in
a defined direction.

12. Optoelectronic component according to one of the claims 8 to 11,
characterised in that
an adhesive or bonding agent (12) is provided by means of which the
15 optical arrangement (11 or 21) is fixed inside the opening (9a) of the
system carrier (9) and/or the recess (2a) of the auxiliary carrier (2).

13. Optoelectronic component according to one of the claims 8 to 12,
characterised in that
20 predetermined support points or support edges (2b) for the self-adjusting
alignment of the optical arrangement (11 or 21) are provided with respect
to the optical axis (OA) of the component on the lateral faces (2c) and/or
edges of the recess (2a) of the auxiliary carrier (2) and/or on the lateral
faces (9b) and/or edges of the opening (9a) of the system carrier (9).

25 14. Optoelectronic component according to claim 13,
characterised in that
the support points or support edges are arranged on the outermost edges
(2b) of the recess (2a) facing away from the element (1) and/or on the
30 outermost edges (9c) of the opening (9a) facing away from the element

(1) and/or on a middle section of the wall (= lateral faces) of the opening or recess (9b or 2c).

15. Optoelectronic component according to one of the claims 4 to 14,

5 characterised in that
the sensor (3) is formed by an active electronic component, in particular a semiconductor component, structured in or on the auxiliary carrier (2) or in or on the covering layer formed from same or in or on the element (1).

10 16. Optoelectronic component according to one of the claims 4 to 15,

characterised in that
the sensor (3) is electrically coupled to the element (1) indirectly via another circuit or directly.

15 17. Optoelectronic component according to claim 15 or 16,

characterised in that
the semiconductor component is formed by a diode or a transistor.

18. Optoelectronic component according to one of the claims 1 to 17,

20 characterised in that
the auxiliary carrier (2) has a substrate of silicon or an SiC compound or is formed by such a material.

19. Optoelectronic component according to one of the claims 1 to 18,

25 characterised in that
the element (1) is formed by a VCSEL chip (VCSEL = Vertical Cavity Surface Emitting Laser) with a coherently radiating diode, an IRED chip (IRED = InfraRed Emitting Diode), a chip with a spontaneously emitting diode or a suchlike chip emitting light on a surface.

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20. Optoelectronic component according to one of the claims 1 to 19,
characterised in that
the system carrier (9) is encapsulated at least in some areas with the
auxiliary carrier (2) attached to it by means of a non-transparent pressing,
5 casting or moulding mass (10).

21. Method for producing an optoelectronic component consisting of a light
emitting or light receiving element (1) and a system carrier (9) for the
support or assembly of the component, with the process steps:

10 - provision of an auxiliary carrier (2) transparent to light at least in some
areas or at least translucent and made of heat conducting material, a
recess (2a) for the unimpeded passage of light being produced in the
auxiliary carrier (2) by anisotropic etching,

15 - connection of the auxiliary carrier (2) to the element (1) while producing
a thermal coupling between the auxiliary carrier (2) and the element (1),
and

- mechanical connection of the auxiliary carrier (2) supporting the element
(1) to the system carrier (9),
characterised in that

20 a covering layer with a thickness of $\leq 50 \mu\text{m}$ covering the recess is left in
place while etching the recess (2a).

22. Method for producing an optoelectronic component according to claim 21,
characterised in that

25 a sensor (3) independent with respect to the element (1) is formed by
means of structuring steps used in semiconductor technology on or in the
auxiliary carrier (2) and/or the element (1) before connecting same.

23. Method for producing an optoelectronic component according to claim 21
or 22,

characterised in that a multiplicity of auxiliary carriers (2), which are to be separated in a further process step, are connected jointly in a composite structure with independent sensors (3) and/or with the elements (1) to be connected to same.

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24. Method for producing an optoelectronic component according to one of the claims 21 to 23, characterised in that an optical arrangement (11 or 21) is fixed in an opening (9a) of the system carrier (9).

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25. Method for producing an optoelectronic component according to claim 24, characterised in that the optical arrangement (11 or 21) is bonded into the opening (9a) by means of an adhesive or bonding agent (12).

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26. Method for producing an optoelectronic component according to one of the claims 21 to 25, characterised in that the system carrier (9) is encapsulated at least in some areas with the auxiliary carrier (2) attached to it and the element (1) located on it, by means of a non-transparent pressing, casting or moulding mass (10).

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